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Office of Conservation and Renewable Energy

10 CFR Part 430

Energy Conservation Program for Consumer Products; Notice of Proposed Rulemaking and Public Hearing Regarding Test Procedures for Refrigerators, Refrigerator-Freezers and Freezers

DEPARTMENT OF ENERGY

Office of Conservation and Renewable Energy

10 CFR Part 430

[Docket No. CAS-RM-80-118]

Energy Conservation Program for Consumer Products; Notice of Proposed Rulemaking and Public Hearing Regarding Test Procedures for Refrigerators, Refrigerator-Freezers and Freezers

AGENCY: Office of Conservation and Renewable Energy, DOE.

ACTION: Notice of proposed rulemaking and public hearing.

SUMMARY: The Department of Energy (DOE) hereby proposes to amend the test procedures for refrigerators, refrigerator-freezers, and freezers. Test procedures are one part of the energy conservation program for consumer products established pursuant to the Energy Policy and Conservation Act, as amended by the National Energy Conservation Policy Act (NECPA), the National Appliance Energy Conservation Act of 1987 (NAECA) (Pub. L. 100-12) and the National Appliance Energy Conservation Amendments of 1988 (NAECA 1988) (Pub. L. 100-357). Among other program elements, the legislation requires that standard methods of testing be prescribed for covered products.

The purpose of today's notice is to prescribe test procedures for rating refrigerators, refrigerator-freezers and freezers with innovative features, such as variable defrost controls (VDC), dual compressor systems, and the quick freeze operation of freezers.

DATES: Written comments (seven copies) in response to this notice must be received November 25, 1988; requests to speak at the public hearing must be received by November 1; the public hearing will be held on November 7, 1988, at 9:30 a.m.

ADDRESSES: Written comments and requests to speak at the public hearing, and copies of statements of each speaker are to be submitted to: U.S. Department of Energy, Office of Conservation and Renewable Energy, Office of Hearings and Dockets, Refrigerator, Refrigerator-Freezer, and Freezer Test Procedures, Docket No. CAS-RM-80-118, 1000 Independence Avenue, SW., Washington, DC 20585, (202) 586-9320.

The public hearing will be held at Room 1E-245, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585. Please bring nine copies of the oral testimony to Hearing. Copies of the transcript of the public hearing, and the public comments received, may be obtained at the DOE Freedom of Information Reading Room, Room 1E-190, 1000 Independence Avenue, SW., Washington DC 20585, (202) 586-5969.

FOR FURTHER INFORMATION CONTACT:

Douglass S. Abramson, U.S. Department of Energy, Office of Conservation and Renewable Energy, Forrestal Building, Mail Station, CE-132, 1000 Independence Avenue, SW., Washington, DC 20585, (202) 586-9127.

Eugene Margolis, Esq., U.S. Department of Energy, Office of General Counsel, Forrestal Building, Mail Station, GC-12, 1000 Independence Avenue, SW., Washington, DC 20585, (202) 586-9507.

U.S. Department of Energy, Hearings and Dockets, Forrestal Building, Mail Station CE-43.1, Room 6B-025, 1000 Independence Avenue, SW., Washington, DC 20585, (202) 586-9320.

I. Supplementary Information:

a. Background

The Energy Conservation Program for Consumer Products was established pursuant to Title III, Part B of the Energy Policy and Conservation Act (EPCA) (Pub. L. 94-163). Subsequently, EPCA was amended by the National Energy Conservation Policy Act (NECPA) (Pub. L. 95-619), the National Appliance Energy Conservation Act of 1987 (NAECA) (Pub. L. 100-12) [1] and the National Appliance Energy Conservation Amendments of 1988 (NAECA-1988) (Pub. L. 100-357). Among other program elements, section 323 of the Act requires that standard methods of testing be prescribed for covered products, including refrigerators, refrigerator-freezers, and freezers.

The Department of Energy (DOE or the Department) proposed test procedures for refrigerators and refrigerator-freezers, and freezers by notice issued April 21, 1977. (42 FR 21576, April 27, 1977). A public hearing on the proposed test procedures was held on June 14, 1977. The Department issued final test procedures on September 8, 1977. (42 FR 46140, September 14, 1977).

On July 14, 1980, DOE published a response to a petition for rulemaking submitted by the Association of Home Appliance Manufacturers (AHAM), requesting that the burden of test procedures for refrigerators, refrigerator-freezers, and freezers be lessened.

The response included the comments of the National Bureau of Standards (NBS), the AHAM recommendations, and DOE's proposed revised test procedures. (45 FR 47396, July 14, 1980). On October 14, 1981, DOE proposed an amended version of the revised test procedures (46 FR 50544) which defined steady-state conditions and requirements for the test chamber ambient air temperature gradient. The final rule establishing new test procedures for refrigerators, refrigerator-freezers and freezers, was published on August 10, 1982. (47 FR 34517). Editorial corrections to the final rule were published March 29, 1983. (48 FR 13013). The August 1982 final rule established a three-year transition period, expiring on September 9, 1985, for the new test procedures. Subsequently, DOE received four petitions for waivers concerning electronic adaptive defrost controls (ADC). The first petition (Case No. RF-001), received from Whirlpool Corporation (Whirlpool) on November 14, 1984, was published in the **Federal Register** on January 11, 1985. (50 FR 1628). Based on DOE's review of comments and data provided, DOE determined that the test procedures had no provision for determining the interval between defrost cycles for ADC-equipped refrigerator-freezers which would be comparable to normal usage patterns. Based on DOE's review of Whirlpool's field data and comments from two other manufacturers, DOE developed an alternative test method which was included in the Decision and Order granted Whirlpool on August 23, 1985. (50 FR 34186).

The second Petition for Waiver (Case No. RF-002) received from White Consolidated Industries (WCI) on October 23, 1985, was published in the **Federal Register** on December 16, 1985. (50 FR 51284). WCI also had developed an electronic defrost control system (EDC) and requested permission to use the test procedures granted previously to Whirlpool. Based on DOE's review of comments and the Petition for Waiver, DOE developed an alternate test method based on the long-time automatic defrost test in Appendix A1 of Subpart B of 10 CFR Part 430, which was included in the Decision and Order granted WCI. (51 FR 15679, April 26, 1986).

On March 12, 1986, Whirlpool submitted Petitions for Waiver of DOE test procedure requirements for two new ADC-equipped refrigerator-freezers (Case Nos. RF-003 and RF-004). Both petitions were published in the **Federal Register** on May 21, 1986. (51 FR 18655).

[1] Part B of Title III of EPCA as amended by NECPA, NAECA and NAECA-1988 is referred to in this notice as the "Act".

In each petition, Whirlpool requested to use the alternate test procedure granted in Case No. RF–001. Based upon DOE's review of the petitions and the comments received, the Department granted each petition, allowing Whirlpool to use the same test procedure specified in the DOE's Decision and Order in Case No. RF–001. (51 FR 36591, October 14, 1986).

Following an analysis of the two defrost control systems and a review of past comments and data, DOE is proposing a test procedure for variable defrost control (VDC) equipped refrigerator-freezers and freezers based on the long-time automatic defrost test in Appendices A1 and B1 to Subpart B to eliminate the need for the outstanding waivers.

DOE is also proposing to establish test procedures for refrigerator-freezers with dual compressor systems and procedures for freezers with a rapid freezing feature.

II. Discussion:

This proposed rulemaking presents the various developments in the manufacture of refrigerators, refrigerator-freezers, and freezers which have occurred since the August 10, 1982, final rule.

a. Variable Defrost Control

Four petitions for waivers have been granted for refrigerator-freezers equipped with a variable defrost control system. Three were given to the Whirlpool Corporation and one to White Consolidated Industries. Variable defrost control systems are identified differently by each manufacturer, for example, as an adaptive defrost control system (ADC) by Whirlpool, and as an electronic defrost control (EDC) by WCI. DOE is proposing that the term "variable defrost control" (VDC) include these two defrost systems as well as any future products which have electronic or mechanical devices which can change the interval between defrosts by evaluating the operating characteristics and the compressor run time of the product, including demand defrost.

The defrost mechanism on a typical automatic defrost refrigerator-freezer is operated by a timer which counts compressor on-time. The defrost cycle begins after a set compressor on-time, typically 12 hours. The VDC system relies on various inputs, in addition to compressor on time to determine the time between defrost cycles. These inputs could be the number of door openings for refrigerator or freezer compartments, air flow rate across coils, defrost time for previous defrost, outside temperature, etc. Since each manufacturer is likely to take a unique approach to these characteristics, DOE today is proposing a method of testing that can be used by all manufacturers for rating those refrigerator-freezers and freezers with a variable defrost system.

The petitions for waivers identified three problem areas in the existing test procedure. The first is the inability of the current test procedure to determine the interval between defrost cycles for VDC equipment that would be comparable to normal usage patterns. Second is the low humidity conditions normally encountered within the test chamber and the lack of refrigerator and freezer compartment door openings. Third, the time period between defrost cycles would become excessively longer than that which would be expected under normal usage conditions. This lengthening of the period between defrost cycles increases the duration of the test such that the test is unduly burdensome to conduct. Information contained in Whirlpool's petitions for waiver for its ADC device show that door opening frequency and duration are heavily weighted factors in determining the time between defrost periods.

DOE began its development of a VDC test procedure by reviewing the waivers issued and consulting NBS in evaluating data and alternate test procedures. NBS prepared comments analyzing the two methods used in the waivers and offered alternatives for the new test procedure. Concurrent with the NBS evaluation of VDC test procedures, AHAM provided DOE a copy of "Recommended Test Procedure for Determining The Energy Consumption for Adaptive Defrost Refrigerator-Freezers and Freezers." DOE evaluated the AHAM test procedure and is including it in today's proposal as an optional test procedure. As discussed below, DOE believes the AHAM proposed test procedure, a test procedure based on door openings, is a burdensome test method and therefore, not justified as a requirement for testing all VDC-equipped units.

The primary issue in the determination of an appropriate VDC test procedure is the typical time between defrost cycles. In the review of the petitions for waiver, NBS concluded that the time between defrost cycles could be as much as three days (72 hours). This would credit VDC-equipped units with 80 to 90 percent of the maximum energy reduction possible. Further analysis of this issue has led to an NBS study of variable defrost control and the impact of compressor run time for rating refrigerator-freezers.[2] The study presents an analytical method of determining the variables in the rating procedure. DOE contacted Whirlpool Corporation in an effort to gather test data for this proceeding. However, Whirlpool had no available data other than that provided in Case No. RF–001. The Whirlpool data suggested that with limited door openings, ADC units could run for six days before defrosting.

The Department's analysis of all available information has identified the ratio of compressor on-time (CT) to total on-time as typically 50 percent. This implies that an automatic defrost refrigerator-freezer equipped with a 12-hour timer on the compressor should perform one defrost cycle every 24 hours, or once a day. The compressor on-time for VDC models is only one factor used in the control algorithm [3] to determine the time between defrost cycles. Other factors evaluated in the algorithm include door openings, previous defrost duration, frost build-up, and consumer usage factors.

The value of CT calculated using the NBS recommended approach can differ from the value measured in the field due to variations in consumer behavior. The manufacturer establishes the degree of importance assigned to the factors that determine defrost time. The duration between defrost cycles and the value of CT are affected by how the manufacturer's algorithm views the consumer usage pattern. Since the consumer usage pattern is an uncontrollable variable, even for a standard size family, the only controllable element is the manufacturer's input to the algorithm. Therefore, DOE determined that the input values selected by the manufacturer should have boundaries.

Since the compressor on-time (CT) between defrosts does not reach infinity and is not zero for VDC-equipped models, the value CT is bounded by a minimum or least time (CTL) and a maximum time (CTM).[4] These values are specified by the manufacturer and included in the VDC algorithm. NBS evaluated the effect CT had on the per day energy consumption. As part of this evaluation, a frequency factor (F) was created to express the ratios between CT, CTL, and CTM. NBS determined that the value CT had significant effect

[2] "Energy Rating of Refrigerators with Variable Defrost Controls" Bal Mahajan PH.D., P.E., National Bureau of Standards, May 7, 1987.

[3] Algorithm—A mathematical rule or procedure for solving a problem.

[4] A value of infinity would mean tha the unit never defrosts while zero would result in the unit constantly defrosting.

on per day energy consumption when defrost cycles are spaced 6 to 12 hours apart and a lesser effect as the time between defrosts reached 72 hours of compressor on-time. Based on NBS's evaluation of various defrost cycles, DOE proposes that a value of 0.2 for F be representative of VDC-equipped units. Assuming a value of 0.2 for F, allows CT, and then enery use, to be calculated.

The Decisions and Orders issued to Whirlpool (Cases No. RF–003, RF–004) and WCI (Case No. FR–002) did not assign a value for F to be used in the long-time automatic defrost equation. Rather, the value of CT was assigned based on NBS's review of each Petition for Waiver. Whirlpool was assigned a value of 36 hours for CT and WCI assigned 12 hours. Because CT varies by design based on the manufacturers' VDC algorithms, DOE examined alternatives to prescribing CT which would allow VDC-equipped models to be individually evaluated. NBS recommended setting a value of F based on the ratio of CTL and CTM. Based on its review of the petitions for waiver, NBS recommended boundaries for the values of CTL and CTM in the manufacturers' VDC algorithms. These boundaries are set at a minimum or CTL of 12 hours and a maximum or CTM of 84 hours.

AHMA recommended a different approach to determine the value of CT, involving the performance of a third test. The test includes door openings, multiple unit test data for statistical certainty, and specific (different) dry and wet bulb temperatures for the environmental chamber. AHAM provided field test data as support documentation. The data included information on door openings and time between defrost cycles in four geographical regions.

AHAM recommended that a single basic model be tested and the test results be applied to each of the manufacturer's VDC-equipped models. AHAM indicated that this third test would be extremely burdensome if required for all models. DOE agrees that the test is burdensome because of the differing ambient temperature and humidity test conditions, extreme time requirement, over 100 hours, and the addition of door openings. DOE also believes that test results from one basic model can not be assigned to other basic models because varing door styles, capacities and features will impact test results. Therefore, DOE is proposing VDC-equipped models be tested according to the existing long-term defrost test. CT is to be calculated using a value for F of 0.2 and that at the manufacturer's option a test can be performed to determine CT.

An optional third test is included in today's proposed rule which allows manufacturers to determine the value of F and CT. This third test is provided as an optional method of determining the value of CT for manufactures that believe the unit will operate with a substantially better frequency value than the F=0.2 established in the proposed rule. The burden associated with documenting an actual value for CT makes the optional testing of limited use to manufacturers. The test is based on procedures proposed by AHAM and modified by DOE. The only purpose of this test is to determine compressor on-time between defrosts for VDC equipped models. It has no application for any model equipped only with a compressor timer for automatic defrost or with no automatic defrost features. This test, which requires multiple units be tested for statistical compliance, involves door openings in an environmental chamber at specific new ambient conditions. The test requires a stabilization period consisting of three defrost intervals run from the end of one defrost to the end of the next defrost. The average duration between defrosts of the three intervals would establish the value of CT.

The optional test includes 24 fresh food and six freezer compartment door openings each for 12±2 seconds. The purpose of these openings is to trigger the features other than compressor on-time in the manufacturer's algorithm. The door openings allow for the transfer of warm humid air into the respective compartment, thereby increasing frost build-up. Multiple units of the same model will be tested to achieve a 95 percent confidence in the time between defrosts. DOE believes that the time intensiveness of this optional test will lead most manufacturers to accept the DOE value of F and only those VDC systems with exceptionally better values for F will be tested.

b. Method of Testing Dual Compressor Refrigerator-Freezer Units

The concept of dual compressors was raised as an energy efficiency measure during the evaluation of energy conservation standard levels for refrigerator-freezers. This notice, however, does not address the effectiveness of dual compressors in energy efficiency. DOE is proposing to establish test procedures for automatic defrost refrigerator-freezers with dual compressor systems.

A refrigerator-freezer model with a dual compressor system operates as two separate systems, one for each section of the cabinet. The existing test procedure assumes a single system. For the most part, the test procedure is unaffected by dual compressors, however, the defrost energy measurement portion of the test is affected. Since both compressor systems do not defrost at the same frequency or at the same time, the measurement of defrost energy is more complicated for a dual compressor system. The freezer section, although smaller than the refrigerator section, operates more often to maintain the colder temperature. The freezer section also builds frost faster, requiring more defrosts.

To measure the energy consumption of dual-compressor refrigerator-freezers, the DOE test procedure in Appendix A1 is used, modified only for those models with automatic defrost. The testing difference occurs because measuring the defrost energy in automatic defrost models is affected by the more frequent operation of the freezer compressor system, which activates more defrosts. Assuming both defrost timers are set for 12 hours of compressor on-time, the freezer will defrost sooner than the refrigerator. DOE proposes that an independent measurement of defrost energy for each system be performed. The test will measure the energy used for two defrost cycles for each system and the time elapsed between cycles. The freezer compressor is considered the primary system since the large temperature difference causes it to cycle more frequently than the refrigerator system. Both systems' energy measurements are included in the total energy equation.

The test conditions remain the same. Additional measurement devices (watt meters, timers, etc.) are incorporated to measure the energy consumption of each compressor system.

DOE expects this proposed method of evaluating energy consumption for dual compressor units to create a minimum burden on manufacturers and to provide a comparison with single compressor units. The proposed test procedures apply to automatic defrost units only; dual systems with manual defrost are to be tested according to the existing test procedure for single compressor units.

c. Through-The-Door-Features

Several manufacturers, in an effort to provide the customer with increased utility and anticipated energy savings, have developed through-the-door, multi-door, and other special door features. These features could result in the unit using more energy during testing due to a lack of insulation. However, because the number of door openings could be

reduced, these features could also result in energy savings. These special features, however, provide utility in the form of convenient ice dispensing to the consumer. The existing DOE test procedure for refrigerators and refrigerator-freezers does not use actual door openings; instead, it increases the surrounding temperature to increase heat transfer to compensate for the exchange of air that occurs during door openings and the internal loads. Therefore, the test procedure cannot measure any energy savings due to reduced door openings.

The Department considered these new designs in its review of information and data for this rulemaking. However, DOE was unable to obtain sufficient documentation and/or test data from manufacturers, trade associations or professional organizations prior to this rulemaking concerning the energy consumption of a door opening. A review of previous rulemakings and available data indicated that one available option was to expand the refrigerator-freezer classes to include all door features. This was viewed as unacceptable because each feature would count the same. DOE also believes that this option most likely would confuse consumers and reduce the potential for energy savings. A second option would be to amend the existing test procedure. However, no data has been presented to support claims that the energy saved by fewer large door openings saves energy above that used to compensate for increased door edge and gasket area and decreased door insulation. Although several manufacturers have expressed a desire to have the models so equipped receive a form of energy credit, the lack of data makes it difficult for DOE to justify amending the existing test procedure. Therefore, DOE is not including any measures in today's notice which would amend test procedures for refrigerator-freezer models with through-the-door features, refreshment centers, or multiple compartment/multidoor refrigerator or freezer sections.

d. Rapid or Quick Freeze Feature

The quick freeze feature is found primarily on freezers. DOE believes that this option is always consumer controlled, i.e., it is operated (turned on and off) manually. Activation of the quick freeze feature places the compressor in a steady-state condition. Its purpose is to freeze rapidly non-frozen items upon placement in the freezer.

The quick freeze feature is an option being introduced on some new models of freezers. Since the current test procedure does not address manually operated options, DOE examined the adequacy of the test procedure to determine if it provides accurate and fair measures of energy consumption. By analyzing the option's function in the freezer, DOE determined that the quick freeze feature acts as a thermostat override, allowing the compressor to operate continuously. However, it also was apparent that the consumer could perform a similar function by adjusting the thermostat to the coldest setting. The quick freeze option, however, gives the consumer a single switch allowing the freezer to return to the original thermostat setting and, in some designs, includes a reminder light.

DOE believes that the test procedure for freezers in Appendix B–1, 10 CFR Part 430 is sufficient for testing models equipped with manually operated features such as quick freeze. DOE proposes to amend the test procedure to indicate that the consumer operated feature, quick freeze, will remain off unless it is necessary to bypass the thermostat to cause the compressor to run continuously as described in section 3.1 of Appendix B1. By this amendment to the test procedure, DOE believes that an option with utility to the consumer will be rated fairly and accurately.

III. Public Comment Procedures

a. Written Comment Procedures

Interest persons are invited to participate in the rulemaking by submitting data, views, or arguments with respect to the proposed amendments set forth in this notice to the address indicated at the beginning of the notice.

Comments should be identified on the outside of the envelope and on documents submitted to DOE with the designation "Refrigerators, Refrigerators-Freezers, and Freezers Test Procedures, Docket No. 80–118. Nine (9) copies are requested to be submitted. All comments received by the date specified at the beginning of this notice and all other relevant information will be considered by DOE before final action is taken on the proposed regulations. Pursuant to the provisions of 10 CFR 1004.11, any person submitting information which he or she believes to be confidential and exempt by law from public disclosure should submit one complete copy of the document and 6 copies, if possible, from which the information believed to be confidential has been deleted. DOE will make its own determination with regard to the confidential status of the infomation and treat it according to its determination.

Factors of interest to DOE when evaluating requests to treat as confidential information that has been submitted include: (1) A description of the item; (2) an indication as to whether and why such items of information have been treated by the submitting party as confidential, and whether and why such items are customarily treated as confidential within the industry; (3) whether the information is generally known or available from other sources; (4) whether the information has previously been made available to others without obligation concerning its confidentiality; (5) an explanation of the competitive injury to the submitting person which would result from public disclosure; (6) an indication as to when such information might lose its confidential character due to the passage of time; and (7) whether disclosure of the information would be in the public interest.

b. Public Hearing

1. Procedures for Submitting Requests to Speak.

The time and place of the public hearing are indicated at the beginning of this notice. DOE invites any person who has an interest in today's proposed rule, or who is a representative of a group or class of persons that has an interest in the proposed amendments, to make a request for an opportunity to make an oral presentation. Such requests should be directed to the address indicated at the beginning of this notice. Requests may be hand delivered to such address between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday. Requests should be labeled "Refrigerators, Refrigerator-Freezers, and Freezers Test Procedures, Docket No. CAS–RM–80–118" both on the document and on the envelope.

The person making the request should briefly describe the interest concerned and, if appropriate, state why he or she is a proper representative of the group or class of persons that have such an interest, and give a telephone number where he or she may be contacted.

Each person to be heard is requested to submit seven (7) copies of his or her statement to the address and by the date given at the beginning of this notice. In the event any person wishing to testify cannot meet this requirement, alternative arrangements can be made with the Office of Hearing and Dockets in advance of the hearing by so indicating in the letter requesting to make an oral presentation.

2. Conduct of Hearing

DOE reserves the right to select the persons to be heard at this hearing, to schedule the respective presentations, and to establish the procedures governing the conduct of the hearing. Each presentation shall be limited to 20 minutes.

A DOE official will be designated to preside at the hearing. The hearing will not be a judicial or an evidentiary-type hearing, but will be conducted in accordance with 5 U.S.C. 553 and section 336 of the Act. At the conclusion of all initial oral statements, each person who has made an oral statement will be given the opportunity to make a rebuttal statement. The rebuttal statements will be given in the order in which the official statements were made and will be subject to time limitations.

Any interested person who wishes to ask a question at the hearing may submit the question, in writing, to the presiding officer to be asked of any person making a statement at the hearing. The presiding officer will determine whether the question is relevant and whether time limitations permit it to be presented for an answer.

A transcript of the hearing will be made and the entire record of the hearing, including the transcript, will be retained by DOE and made available for inspection at the DOE Freedom of Information Reading Room, Room 1E–152, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC, between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday. For information concerning the availability of records at the Freedom of Information Reading Room, call (202) 586–6020. In addition, any person may purchase a copy of the hearing transcript from the reporter.

IV. Environmental Review

Pursuant to section 7(c)(2) of the Federal Energy Administration Act of 1974, a copy of this notice has been submitted to the Administrator of the Environmental Protection Agency for his comments concerning the impact of this proposal on the quality of the environment.

Since test procedures under the energy conservation program for consumer products will be used only to standardize the measurement of energy usage, and will not affect the quality of distribution of energy usage, prescribing test procedures will not result in any environmental impacts. DOE, therefore, has determined that prescribing test procedures under the energy conservation program for consumer products clearly is not a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969. Consequently, neither an Environmental Statement nor an Environmental Assessment is required for the proposed rule.

V. Review Under Executive Order 12291

The proposed rule has been reviewed in accordance with Executive Order 12291 which directs that all regulations achieve their intended goals without imposing unnecessary burdens on the economy, on individuals, on public or private organizations, or on State and local governments. The Executive Order also requires that regulatory impact analyses be prepared for "major rules." The Executive Order defines "major rule" as any regulation that is likely to result in: (1) An annual effect on the economy of $100 million or more; (2) a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or (3) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The proposed rule would amend already-existing test procedures for refrigerators, refrigerator-freezers, and freezers. DOE has determined that any burden imposed on any person, industry, or government entity by the amendment of extent procedures, based in part on commercial standards, is not significant to bring the proposed rules within the definition of "major rule."

VI. Regulatory Flexibility Act

The Regulatory Flexibility Act, Pub. L. 96–345 (5 U.S.C. 601–612), requires that an agency prepare an initial regulatory flexibility analysis to be published at the time the proposed rule is published. This requirement (which appears in section 603) does not apply if the agency "certifies that the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities." The proposed rule affects manufacturers of refrigerators, refrigerator-freezers, and freezers. As previously discussed, the proposed changes would not have significant economic impact, but rather would simply improve the test procedures. Therefore, DOE certifies that the proposed rule, if promulgated, would not have a "significant economic impact on a substantial number of small entities."

VII. "Takings" Assessment Review

Executive Order 12630 (53 FR 8859, March 18, 1988) directs that, in proposing a regulation, an agency conduct a "takings" review. Such a review is intended to assist agencies in avoiding unnecessary takings and help such agencies account for those takings that are necessitated by statutory mandate.

For purposes of the Order:

"Policies that have takings implications" refers to Federal regulations, proposed Federal regulations, proposed Federal legislation, comments on proposed Federal legislation, or other Federal policy statements that, if implemented or enacted, could effect a taking, such as rules and regulations that propose or implement licensing, permitting, or other condition requirements or limitations on private property use, or that require dedications or exactions from owners of private property.

It appears that there are three parts of the appliance standards program that could conceivably be viewed as having "takings implications." These are testing (certification) requirements, the impacts of standard levels, and possible DOE testing of products for validation.

This proposed rulemaking is concerned with the first part, namely, testing. The Department believes that such a requirement does not constitute a "taking" of private property. The establishment of test procedures involves no exchange of property. Manufacturers maintain control of the property for all intents and purposes.

Therefore, the Department believes that the requirement of testing and the establishment of test procedures as part of the appliance standards program do not represent a "taking" under the provisions of E.O. 12630.

List of Subjects in 10 CFR Part 430

Administrative practice and procedure, Energy conservation, Household appliances.

In consideration of the foregoing, it is proposed to amend Part 430 of Chapter II of Title 10, Code of Federal Regulations, as set forth below.

Issued in Washington, DC, September 9, 1988.

Donna R. Fitzpatrick,

Assistant Secretary, Conservation and Renewable Energy.

PART 430—ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS

1. The authority citation for Part 430 continues to read as follows:

Authority: Energy Policy and Conservation Act, Title III, Part B, as amended by National Energy Conservation Policy Act, Title IV, Part 2, (42 U.S.C. 6291–6309) and National Appliance Energy Conservation Act of 1987 (42 U.S.C. 6291–6309).

2. Subpart B of Part 430 is amended by adding sections 1.11, 3.3, 4.1.2.2, 4.1.2.3, 4.1.2.4, 5.2.1.3, 5.2.1.4, and 5.2.1.5 and adding a sentence at the end of sections 2.1, 3.2, 4.1.2, and 5.1.2 of Appendix A1 as follows:

Appendix A1 (Alternative) to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Electric Refrigerators and Electric Refrigerator-Freezers

* * * * *

1.11 "Variable Defrost Control" means a long-time automatic defrost system (except the 14-hour defrost qualification does not apply) where successive defrost cycles are determined by an operating condition variable or variables other than solely compressor operating time. This includes any electrical or mechanical device. Demand defrost is a type of variable defrost control.

* * * * *

2.1 * * * The ambient temperature shall be 80 ± 2°F dry bulb and 67 ± 1°F wet bulb during the stabilization period and during the test period when the unit is tested in accordance with section 3.3.

* * * * *

3.2 * * * Variable defrost control models: 5°F (−15°C) freezer compartment temperature and 38 ± 2°F fresh food compartment temperature during steady-state conditions with no door openings. If both settings cannot be obtained, then test with the fresh food compartment temperature at 38 ± 2°F and the freezer compartment as close to 5°F as possible.

* * * * *

3.3 Variable Defrost Control Optional Test. After a steady-state condition is achieved, the optional test requires door openings for 12 ± 2 second every 60 minutes on the fresh food compartment door and a simultaneous 12 ± 2 second freezer compartment door opening occuring every 4th time, to obtain fresh food and six freezer compartment door openings per 24-hour period. The first freezer door opening shall be simultaneous with the fourth fresh food door opening. The doors are to be opened 60 to 90° with an average velocity for the leading edge of the door of approximately 2 FT/Sec. Prior to the initiation of the door opening sequence, the refrigerator defrost control mechanism may be re-initiated in order to minimize the test duration.

* * * * *

4.1.2 * * * If the model being tested has a variable defrost control, the provisions of section 4.1.2.2 or .3 shall apply. If the model has a dual compressor system the provisions of 4.1.2.4 shall apply.

* * * * *

4.1.2.2 Variable Defrost Control. If the model being tested has a variable defrost control system, the test shall consist of three parts. Two parts shall be the same as the test for long-time automatic defrost (section 4.1.2.1). The third part is the optional test to determine the time between defrost (section 5.2.1.3). The third part is used by manufacturers that choose not to accept the DOE value for F of 0.20, to calcuate CT.

4.1.2.3 Variable Defrost Control Optional Test. After steady-state conditions with no door openings are achieved in accordance with section 3.3 above, the test is continued using the above daily door opening sequence until stabilized operation is achieved. Stabilization is defined as a minimum of three consecutive defrost cycles with times between defrost that will allow the calculation of a Mean Time Between Defrosts (MTBD1) that satisfies the statistical relationship of 95 percent confidence. The test is repeated on at least one more unit of the model and until the Mean Time Between Defrosts for the multiple unit tests (MTBD2) satisfies the statistical relationship. If the time between defrosts is greater than 84 hours (compressor on time) and this defrost period can be repeated on a second unit, the test may be terminated at 84 hours (CT) and the absolute time value used for MTBD for each unit.

4.1.2.4. Dual Compressor Systems with Automatic Defrost. If the model being tested has separate compressor systems for the refrigerator and freezer sections, then the two part method in 4.1.2.1 shall be used. The second part of the method will be conducted separately for each system.

* * * * *

5.1.2 * * * For models equipped with variable defrost controls, compartment temperatures shall be those measured in the first part of the test period specified in 4.1.2.2 above.

* * * * *

5.2.1.3 Variable Defrost Control. The energy consumption in kilowatt-hours per day shall be calculated equivalent to:

$ET = (1440 \times EP1/T1) + (EP2 - (EP1 \times T2/T1) \times 12/CT$

where ET and 1440 are defined in 5.2.1.1 and EP1, EP2, T1, T2 and 12 are defined in 5.2.1.2

$CT = (CT_L/CT_M)(F \times (CT_M - CT_L) + CT_L)$

CT_L = least or shortest time between defrosts in tenths of an hour (but not less than 12 hours)

CT_M = maximum time between defrost cycles in tenths of an hour (but not more than 84 hours)

F = ratio of per day energy consumption in excess of the least energy and the maximum difference in per day energy consumption

$F = (1/CT - 1/CT_M)/(1/CT_L - 1/CT_M) = (ET - ET_L)/(ET_M - ET_L)$

or F = 0.20 in lieu of testing to find CT

ET_L = least electrical energy used (kilowatt hours)

ET_M = maximum electrical energy used (kilowatt hours)

5.2.1.4 Optional Test Method for Variable Defrost Controls.

$CT = MTBD \times 0.5$

where

MTBD = mean time between defrosts

$$MTBD = \frac{\Sigma X}{N}$$

where

X = time between defrost cycles

N = number of defrost cycles

5.2.1.5 Dual Compressor Systems with Automatic Defrost. The two part test method in 4.1.2.2 must be used, the energy consumption in kilowatt-hours per day shall be calculated equivalent to:

$ET = (1440 \times EP1/T1) + (EP_2 - (EP_F - (EP_F \times T2/T1)) \times 12/CT_F + (EP_2 - EP_R \times T3/T1)) \times 12/CT_R)$

where ET, 1440, EP1, T1, EP2, 12, and CT are defined in 5.2.1.2

EP_F = energy expended in kilowatt-hours during the second part of the test for the freezer system.

EP_R = energy expended in kilowatt-hours during the second part of the test for the refrigerator system.

T2 and T3 = length of time in minutes of the second test part for the freezer and refrigerator systems respectively.

CT_F = compressor on-time between freezer defrosts (tenths of an hour).

CT_R = compressor on-time between refrigerator defrosts (tenths of an hour).

* * * * *

3. Subpart B, Part 430 is amended by adding sections 1.10, 1.11, 3.3, 4.1.2.2, 4.1.2.3, 5.2.1.3, and 5.2.1.4 and adding a sentence to the end of sections 2.1, 2.2., 3.1, 3.2, 4.1.2, and 5.1.2 of Appendix B1 as follows:

Appendix B1 (Alternative) to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Freezers

* * * * *

1.10 "Variable Defrost Control" means a long-time automatic defrost system (except the 14-hour defrost qualification does not apply) where successive defrost cycles are determined by an operating condition variable or variables other than solely compressor operating time. This includes any electrical or mechanical device. Demand defrost is a type of variable defrost control.

1.11 "Quick freeze" means optional feature on freezers which is initiated manually and shut off manually. It by-passes the thermostat control and places the compressor in a steady-state operating condition until it is shut off.

* * * * *

2.1 * * * The ambient temperature shall be 80±2°F dry bulb and 67°F wet bulb during the stabilization period and during the test period when the unit is tested in accordance with section 3.3.

2.2 * * * The quick freeze option shall be switched off unless specified.

* * * * *

3.1 * * * If the model has the quick freeze option, it is to be used to by-pass the temperature control.

3.2 * * * Variable defrost control models shall achieve 0±2° during the steady-state conditions prior to the optional test with no door openings.

3.3 Variable Defrost Control Optional Test. After a steady-state condition is achieved, the door opening sequence is initiated with a 18 ±2°F second freezer door opening occurring every eight hours to obtain three door openings per 24-hour period. The first freezer door opening shall occur at the initiation of the test period. The door(s) are to be opened 60 to 90° with an average velocity for the leading edge of the door of approximately two feet per second. Prior to the initiation of the door opening sequence, the freezer defrost control mechanism may be re-initialized in order to minimize the test duration.

* * * * *

4.1.2 * * * If the model being tested has a variable defrost control the provisions of 4.1.2.2. shall apply.

* * * * *

4.1.2.2 Variable Defrost Control. If the model being tested has a variable defrost control system, the test shall consist of three parts. Two parts shall be the same as the test for long-time automatic defrost in accordance with section 4.1.2.1 above. The third part is the optional test to determine the time between defrosts (5.2.1.3). The third part is used by manufacturers that choose not to accept the DOE value for G of 0.20, to calculate CT.

4.1.2.3 Variable Defrost Control Optional Test. After steady-state conditions with no door openings are achieved in accordance with section 3.3 above, the test is continued using the above daily door opening sequence until stabilized operation is achieved. Stabilization is defined as a minimum of three consecutive defrost cycles with times between defrost that will allow the calculation of a Mean Time Between Defrosts (MTBD1) that satisfies the statistical relationship of 95 percent confidence. The test is repeated on at least one more unit of the model and until the Mean Time Between Defrosts for the multiple unit tests (MTBD2) satisfies the statistical relationship. If the time between defrosts is greater than 84 hours (compressor on time) and this defrost period can be repeated on a second unit, the test may be terminated at 84 hours (CT) and the absolute time value used for MTBD for each unit.

* * * * *

5.1.2 * * * For models equipped with variable defrost controls, compartment temperatures shall be those measured in the first part of the test period specified in 4.1.2.2.

* * * * *

5.2.1.3 Variable Defrost Control. The energy consumption in kilowatt-hours per day shall be calculated equivalent to:

$ET=(1440\times EP1/T1)+(EP2-(EP1\times T2/T1)\times 12/CT$

where ET and 1440 are defined in 5.2.1.1 and EP1, EP2, T1, T2 and 12 are defined in 5.2.1.2

$CT=(CT_L/CT_M)/(F\times(CT_M-CT_L)+CT_L)$

where

CT_L=least or shortest time between defrost in tenths of an hour (but not less than 12 hours)

CT_M=maximum time between defrost cycles in tenths of an hour (but not more than 84 hours)

F=ratio of per day energy consumption in excess of the least energy and the maximum difference in per day energy consumption

$F=(1/CT-1/CT_M)/(1/CT_L-1/CT_M)=(ET-ET_L)/(ET_M-ET_L)$

F=0.20 in lieu of testing to find CT

where

ET_L=least electrical energy consumed, in kilowatt hours

ET_M=maximum electrical energy consumed, in kilowatt hours

5.2.1.4 Variable Defrost Control Optional Test. Perform the optional test for variable defrost control models to find CT.

CT=MTBD×0.5

MTBD=mean time between defrosts

$$MTBD = \frac{\Sigma X}{N}$$

X=time between defrost cycles

N=number of defrost cycles

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